

## HINTS, TIPS AND GADGETS.

### PRESERVATION AND RESTITUTION

Notes on some useful arachnological techniques

by J.A.L.COOKE.

Amongst the difficulties involved in maintaining spirit collections, which have been well-summarised by Levi (1966), evaporation of alcohol is a major problem common to all spider collections both large and small. Even in museum collections that are stored in special containers and regularly inspected, one still finds tubes and bottles dried out from time to time. One way of avoiding this is to add approximately 1% glycerine to the alcohol, but although quite widely used this method has disadvantages. The specimens become messy to handle and the hygroscopic action of the glycerine can cause damage to microscopes, etc. when the preservative is spilt. If the specimen is transferred to glycerine-free alcohol for examination, it is necessary to wait several minutes until the distortions due to the mixing of solutions of different refractive index have subsided.

If the alcohol is allowed to evaporate completely, the specimen remains moist and pliable as the glycerine does not evaporate, but there is a grave risk of mould developing that would destroy the specimen completely. This can be prevented by the addition of a small quantity of phenol or similar fungicide.

The only alternative to ethyl alcohol or methylated spirits that has been widely used for preserving spiders is iso-propyl alcohol, which whilst keeping the specimens in excellent condition is also likely to evaporate if the container is faulty.

Propylene phenoxytol is a new preservative introduced by Owen & Steedman (1956) that has many advantages over alcohol. It has now been extensively tested by museums and is rapidly replacing alcohol in many institutions as the standard preservative. Prof. P.L.G.Benoit tells me that at the Tervuren Museum in Belgium, all their spider material is now stored in it with great success. Although it is apparently expensive (£3.4s.0d for 500 ml.) propylene phenoxytol is used in only 1-2% aqueous solution, so that it is only marginally more costly than alcohol and of course it does not require continual replacement, as does alcohol. The important thing to remember when using propylene phenoxytol as a preservative is that the material must be properly fixed (eg. in alcohol) before being stored.

Propylene phenoxytol, which is manufactured as a bactericide, is also useful as a narcotic. Spiders dropped into a saturated aqueous solution (1-2%) die relaxed, with their limbs extended and much more rapidly than they would in alcohol. It is now my policy to collect into propylene phenoxytol and transfer the day's catch to 70% alcohol overnight for fixation, before transferring back to propylene phenoxytol for storage. Specimens prepared in this way are perfect and much easier to examine. Although I have no practical experience, it seems likely that propylene phenoxytol could also be valuable in pit-fall traps.

The major difficulty in using propylene phenoxytol is its extreme reluctance to go into solution. Simple shaking is not sufficient and one really needs a mechanical mixer. Recently, Steedman (personal commun-

ication) has recommended the addition of propylene glycol, which not only speeds the solution of propylene phenoxytol considerably, but also possesses fungicidal properties.

He suggests making up a stock solution thus:

Propylene glycol	50 ml.
Propylene phenoxytol	20 ml.

For use this can be mixed with water thus:

Stock solution	7 ml.
Water	93 ml.

The stock solution/water mixture will soon go clear with vigorous shaking and is then ready for use. At 8/- per 500 ml. the addition of propylene glycol does not add greatly to the cost of using propylene phenoxytol.

Another potentially useful technique (Prior, 1964) involves embedding fixed material in a mixture of higher alcohols that solidify at room temperature. In my limited experience, spiders returned to alcohol after this treatment show no deterioration and it seems that this technique could prove useful for storing isolated small parts (eg. palps) and for occasions when liquid preservatives are undesirable (eg. postage). A substance with a melting point  $35^{\circ}\text{C}$ . is made from 15 ml. n-tetradecanol and 1.5 ml. n-dodecanol.

Generally speaking, once a spider specimen has been allowed to dry out completely it is ruined. However, it sometimes happens that a specimen of particular importance - a type for instance - suffers in this way and it becomes imperative that it be restored as nearly as possible to its original state for examination and comparison. Several techniques have been suggested, amongst them softening in warm dilute potassium hydroxide or lactic acid, or boiling in 85% alcohol. The method I have found most useful is that proposed by Van Cleave & Ross (1947). They recommend the use of tri-sodium phosphate ( $\text{Na}_3\text{PO}_4$ ) in concentrations of about 0.5% in distilled water. The specimen should be left for 24 hours at least, preferably warmed to about  $35^{\circ}\text{C}$ . although this is not essential. The gentle detergent action of the tri-sodium phosphate will restore even soft-bodied animals like worms to a useable condition, allowing them to be transferred to alcohol for examination and storage, Levi (1966) does not think highly of this technique, but it is not clear that he has used it as recommended. I have had considerable success with it, but of course a spider subjected to this treatment is never as good as new. Nevertheless it is possible to make a detailed examination without legs and palps snapping off, as they tend to do with dried material.

#### References.

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Footnote.

Propylene phenoxytol is manufactured by Nipa Laboratories Ltd., Treforest Industrial Estate, Pontypridd, Glamorgan. A 500 ml. bottle costs £3.4s.0d (plus 7/6d postage and packing). N-tetradecanol (myristyl alcohol) and n-dodecanol are obtainable from B.D.H. Ltd., Poole, Dorset at approximately 26/- per 250 gm. and 14/- per 500 ml. respectively.

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STORING A SPIDER REFERENCE COLLECTION

by J.CROCKER.

The constant need to consult the reference collection necessitates a reasonable degree of accessibility. In the spirit collection there is the ever present problem of evaporation with possible damage to valuable specimens. In order to minimise this danger in conventional spirit collections bulky containers are generally used, taking up rather more cupboard space than is usually available to the amateur worker.

Most workers, at one time or another, are faced with the problem of improving their methods of material retrieval, while limiting the physical size of the collection.

If the excellent guidance on 'Spider Collections and their Organisation' given by Cooke (1966) is followed, the 'Main Collection' will comprise the greater part of all stored material, and not being in constant use can be put away until needed. It will contain tubes of material, each listed and numbered in the 'Collection Notebook', from different habitats. Specimens required for reference are removed from the Main Collection and placed in the 'Reference Collection'. As a cross reference, the checklist numbers of the specimens removed are added against the entry in the Collection Notebook to indicate that these have been transferred from one collection to the other. All specimens in the Reference Collection are numbered in checklist order, advancing in tens (ie. 0010, 0020, 0030) to give a degree of flexibility for the addition of new species.

It has been found convenient to have a series of both sexes of each species, collected in widely separated localities as this helps in future diagnoses to eliminate some of the variations in a species. If reference specimens are stored separately and allowing for 3 or 4 examples of each sex from 75% of the British list, then storage space is required for about 3,000 tubes. In a comprehensive collection provision will be made for the maximum number of specimens with room for new additions and foreign material. Therefore consideration has to be given to storage for approximately 5,000 tubes. With a spirit collection of this size, one must attempt to eliminate the maintenance chore of topping up tubes as spirit evaporates. This is achieved to a large extent by using propylene phenoxytol as recommended by Cooke (1969), and by using tubes with plastic closures, but where valuable specimens are concerned, additional precautions are well worth while.

The basic size of tube for single specimens in the Reference Collection is 0.375" x 1.5", with plastic closures. Tubes should be examined